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sine qua non is wanting. I may add, further, that my theory does not carry with it a belief in the timelessness of ultimate reality. I agree with Dr. Schiller in feeling that this belief robs human action of its deepest significance. But I think that it would be a mistake to suppose that there is no middle ground between the doctrine of "real alternatives" and the doctrine of the unchangeableness of reality.

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REVIEWS AND ABSTRACTS OF LITERATURE

Mind in the Making. E. J. SWIFT. New York: Chas. Scribner's Sons. 1908. Pp. 329.

Most of the material of the volume consists of papers previously published separately in leading scientific and semipopular journals. In each chapter directly or indirectly the author deprecates the fact that educational efforts have largely tended to "submerge the individual." The intricate machinery of American school systems, together with the influence upon our higher institutions of German university methods, has obscured the chief function of education. Educators have increasingly lost sight of positive individual and racial assets, and as a consequence they have in most part adopted standards which distort rather than measure normal development. On the other hand, negative assets, seen, if at all, also from a distorted angle, have not been judiciously curbed and repressed.

In Chapter I. the author discusses "Standards of Human Power." After an exhaustive appeal to biographical literature, the conclusion is reached that the schoolmaster has signally failed in discovering the geniuses in his charge, has accepted too readily the verdict of school studies, has presupposed that he possesses some universal standard, and has on the whole used up "much energy in keeping children of widely varying endowments in the scholastic trail."

The keynote of Chapter II., on "Criminal Tendencies of Boys; Their Cause and Function," is that ideas of sin evolved with social evolution, that morality is a growth, that psychic recapitulation, as well as physical, is a fact. Material gathered by the author from a questionnaire sent to teachers, professors, college students, lawyers, ministers, dentists, merchants, etc., appears to reveal the fact that this early "obedience to racial instincts" by boys indicates the inevitableness and the naturalness of larks, adventures, truancy, fights, thefts of all sorts, and various other miscellaneous escapades formerly denounced as sins. The author further supports the conviction by copious anthropological and biographical citations. In the history of society, piracy, even theft and cannibalism, once ranked high. So in individual life every normal boy must resist or succumb to these "reverberations of savage life." All semi-criminal acts of

boyhood indicate how "deeply impressed in the organism are those of racial instincts." Their existence should not disturb us. The critical points are that development should never be arrested at these lower stages and that we should realize the preponderating influence of environment,—the Elmira Reformatory records indicating that about eighty-five per cent. of the inmates make respectable, self-supporting men. Their offense record began with those tendencies above noted.

As to the "School and the Individual" treated of in Chapter III., the author thinks that we "set up a psychical operating-table in every school-room, and proceed to cut each child according to our measure, forgetful of our own deficiencies, lopping off one individual trait after another, until we have made him commonplace enough to fit into the traditional pedagogical mold." The non-conformists, the gifted, won't fit into the system, they are objectionable, and biography again shows us that the school has not performed this individual-making function. The native tendencies which promote intellectual and moral growth are not, thinks the author, aroused by the pedagogical brand of interest in disagreeable work. "The effective line of approach to children is through their racial instincts and individual dispositions."

Chapter IV. is concerned with "Reflex Neuroses and their Relation to Development," nervous irritants which disturb and pervert mental growth. "The school age is the nascent period of the nervous system." Most paths are formed, some are not yet functionally active, none fixed or accustomed to facile and economic response. Waste energy at this period must interfere with cerebral organization and structural growth. The beginnings of nervous affection are not easily detected. Recourse to numerous medical records shows that "one of the most frequent sources of reflex neuroses is the eyes." Eye-strain is a common cause of central disturbances. Choreic symptoms often develop, epilepsy not infrequently results. Indeed, uncorrected ocular defects may result in almost any pathological organic disease, affecting even the moral nature of the patient. Some cases are particularly difficult to diagnose because acuity of vision is often not interfered with. Adenoids, also, should be considered as a prevalent cause for similar reflex disorders. Here pupils do brain work under diseased conditions. "Teachers should know the part that reflex neuroses play in mental hygiene, and in their preparatory training they should learn to recognize the indications of these affections in order that the nervous irritation may be relieved before it becomes a serious menace to brain growth and mental development."

"Some Nervous Disturbances of Development" (Chapter V.) must be carefully watched in children after their seventh or eighth year. Developing organs, rudimentary cells, and association paths can not easily resist disease or the "inroad of bad heredity." Though the periods for different cerebral developments are unknown, there must be critical times of arrested growth and stages when functional disturbances result in functional derangements. Chorea, a child's disease, should be watched. Incoordination of voluntary movements, temperamental changes, etc., are common and suggestive symptoms. Other disorders of this period of

growth whose natures are less known are tic, migraine, hysteria, and epilepsy. "Half an hour's observation of pupils at their school work will convince one skilled in interpreting nerve signs that these maladies have become so common as to menace our national health." Signs of precocity in children should also be looked upon with suspicion. Education is not merely an intellectual process. "The important thing is to detect disease in its incipency, and this can be done only by those who are in daily association with children. The study of the usual signs of approaching nervous disorders should be a part of the training of teachers. . . ."

Problems in "The Psychology of Learning" (topic of Chapter VI.) are closely related to those of mental development in general. Swift discusses here results of his investigations into the learning process. Three types of skill-acquisition are described and discussed; the acquisition of purely muscular skill (keeping two balls going with one hand, catching and throwing one while the other is in the air); the acquisition of physical and mental skill combined (typewriting); and pure mental acquisition (beginning a language). Of the first type, results were that rate of acquisition was at first slow, then more rapid. The progress was by jumps, automatization appearing in the whole process, with different approximate levels of skill for different stages. Physical condition and waning interest affected the rate of acquisition. Slow progress, however, was only apparent, due to chance emergencies arising in various unexpected situations. Possible changes of interest came with the varying aspects of the task which called for new attitudes from the learner. This learning process furthermore disclosed, just before new adjustments to the obstacles encountered were devised, a physiological limit of attainment. At such point suggestion could speed the process. These new adaptations also were unconsciously adopted at first, introspection merely revealing that they had been acquired. In this complex process, finally, cooperating movements appeared to have improved separately before coordination was accomplished. Left-hand training from the first day in all cases showed a higher degree of skill than the preliminary test revealed, never dropping to that level. These left-hand curves also ascend more rapidly. In all cases right-hand training affected left. The author concludes: "There is no evidence to show that training has general value. Indeed, it all argues strongly for the influence of content. . . . Skill in certain lines may be serviceable in other similar processes, but its value decreases as the difference between the kinds of work increases, and in many cases it is probably reduced to zero."

This report is followed by very interestingly described investigations of the author relating to the similar activities and principles involved in acquiring typewriting skill and in learning Russian. The comments are illustrated by curves showing rate of progress. The common properties of all types of curves in these investigations appear to be that the physical condition is most important (the latest acquisitions, most critical for progress in learning, feeling decidedly the effects of lowered physical tone); that jumps with stops are inevitable characteristics; that sudden advance is a precursor of possible permanent acquisition; that the "no-

progress" periods occupy the greater portion of the time for the process; and that, contrary to other authors, higher and lower orders of habit develop simultaneously. In school, however, these inevitable plateau levels are "unnecessarily increased in number and depressingly prolonged by the rapidity and looseness with which past work has been gone over." These periods, further, should indicate a critical time when "the subject-matter should be reconstructed and reorganized, so that the automatization may not be too mechanical and stereotyped." Since these periods for different pupils can not coincide, "the disadvantage of class examinations is obvious." Monotony being an unavoidable obstacle in all learning, often prolonging too far these periods, diversity of material and method in indicating new phases for attention to be fixed upon becomes a demonstrable psychological necessity. Since, also, there is always the "subconscious utilization of experience," the author further suggests that "the value of constructive play as a factor in development is an unworked educational mine." This "utilization of experience may be accounted for by the organic friction that accompanies unsuccessful reactions." Further, these investigators seemed to furnish evidence that fatigue is "disastrous to the finer acquisitions which characterize growth in skill and knowledge." It is not practise, but successful practise, that counts for progress, sensitive incipient habits being easily deranged. The time element is likewise important, and no amount of work can make the learning process continuous, nor do equal amounts of work produce equivalent results. These plateau periods, after all, the stage when real progress is made, are critically important, and any attempt to shorten the process artificially, as is so often done in classroom work, is almost certain to bring disaster.

Of the "Racial Brain and Education" (Chapter VII.) Swift, reviewing various theories of the evolutionary stages of nerve development, concludes that "education from the physiological side seems to consist in conserving and elaborating the centers for nervous energy and in opening new paths of discharge." Somehow the organization of nervous centers and the ramification of fibers make possible the varying responses of the organism to similar stimuli. Facts significant for education are that in childhood the middle cortical layer is deficient in association-fibers and that growth or medullation of these fibers continues longer than was formerly supposed, perhaps beyond forty years, and that nutritional disturbances interfere with their development. If brain training can not increase the number of cells, collaterals may be increased and associational reach may be enlarged. Other standard investigations, the author thinks, support the view that numerous additional developments upon which mental power may depend, are clearly possible. "Other things being equal, the greater the number of intercellular connections, the greater the intellectual power, and it is beyond question that these intercellular connections increase according to the demand for them in the environment," the development of nerve elements depending upon the opportunity to function. "A rightly ordered system of education must grow out of the physiological requirements of the nervous system. . . .

Spontaneous and reflex movements produced through the discharge of lower centers precede conscious movement," and constitute the foundation for consciousness. Willed action is only thus built into the system. Swift thinks that educationists generally fail to recognize this, and attempt to develop higher centers without regard to the lower. The guiding maxim shall not be that mental efficiency depends upon amount of nervous energy available or exerted, but rather, that it is a "matter of nervous reciprocity, of coordinated impressionability and action." The intellectual helplessness of high school pupils and college students is evidence of the failure of our tutelary method of education to create habits of control of nervous discharge.

As to "Experimental Pedagogy," the discussion in Chapter VIII., the author laments the scant courtesy given it in education. He reports here, also, upon investigations in the Yeatman High School, at St. Louis, upon rates of the learning of pupils, some with and some without foreign language training, as they acquired knowledge of Spanish. Similarities to the principles of the above reported studies in acquisition were noted, and the practicability of his scientific method for actual schoolroom application is demonstrated. Upon a vital and critical step in university extension, he comments thus: "Experimental schools should be established by them, the aim of which should be to solve educational questions that lend themselves to the experimental method, and there are many problems of that nature." Such subjects as the minimum difference of ability may be thus tested. Swift illustrates this by a statistical study of the records of army and navy students. Wide differences shown here indicate even wider ones in elementary and secondary education, and make experimental investigation imperative. Certainly in most subjects the logical order of sequence of studies, too, is not the pedagogical, and the latter should be carefully tested experimentally for such subjects as grammar, language, arithmetic, etc. Such work, qualitative as well as quantitative, furthermore, aside from definite and immediate results, would enable teachers and students to face more squarely the conditions of the situation under discussion—a desideratum keenly felt by those who follow most detached and fragmentary educational experiments. Various sorts of future possible lines of development in scientific pedagogy are discussed.

From the same point of view the author makes a rather vigorous onslaught upon "School-Mastering Education" (Chapter IX.), concluding that material of school studies and method are not chosen from the learner as a starting-point. Nascent periods are ignored, and "instead of utilizing these flashes of racial life to kindle a natural enthusiasm, the schools have tried to create a superstitious interest," imposing upon the child the logical fetish of the adult way of conceiving. Supervision is largely responsible for this mechanized instruction. Low salaries for teachers afford another obstacle. Our industrial system is likewise antagonistic to the above ideal. Some larger conception of education must prevail, for "education is not school-mastering." To this larger conception Swift devotes his concluding chapter, "Man's Educational

Reconstruction of Nature." Here he contrasts types of reaction to immediate and to remote or ideal environment. The intellectual difference between man and lower animals consists in "the difference between associative reasoning . . . and inference in which the connection is obscured, by time or space, or by the complexity of the elements involved." Man's *versus* the animal's environment stretches beyond physical bounds and embraces the universe. To-day we must, hence, educate for an essentially new universe. Human evolution is not merely biological. This indicates that while "man has largely inherited the animal method and only partially adopted the human," his increasing social responsibility consists in enlarging and keeping plastic the socially reconstructed environment, which is the law of life. For this reason education should see and prize the importance of variation in human society. "The function of education here is to develop a mental attitude that is friendly to variation, and to train to rightly see and interpret relations." Information alone, too much relied upon heretofore, has not fitted us and alone can not fit us, for modern complex social adjustments. Reconstruction of society now going on is profound social variation. Education must foresee and prepare youths for this, and cease to be "engrossed in the comparatively petty rôle of teaching lessons." Variation does not mean destruction, but, instead, it serves to suggest a means for the progressive guidance of nature's selection.

Swift's book is stimulating, clearly written, interesting, and within the comprehension of the average reader. Its separate topics afford convenient references for students of education, although it is to be regretted that there is no subject index. On the whole it is a commendable attempt to state education in socio-psychological terms.

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Voltaire philosophe. GEORGES PELLISSIER. Paris: Armand Colin. 1908. Pp. iii + 304.

A book signed by Georges Pellissier is always worth studying carefully. Sober, clear, conscientious, more than any other modern French critic, Pellissier may be relied upon to provide both substantial and enjoyable reading.

These three hundred pages on "Voltaire philosophe" are a remarkable résumé, that will render in literature and philosophy an extremely valuable service. Voltaire is surely not an obscure writer, nor difficult to understand; but a book like the one under consideration fills its place; because, first, it is seldom that people will read him without being prejudiced either in favor of him or, more frequently, against him; and, secondly, because he has not by any means held the same opinions invariably, as is often thought; on the contrary, during his long career as a writer he has changed his views in several items, and those changes are important to know in order to reach an adequate appreciation of the thinker. Now, although many would like to do it, they can not afford the time to read through the more than forty large volumes of Voltaire's works; Pellissier